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Item Type	Article
Authors	Buckley, Eugene
Download date	2026-05-11 00:44:07
Link to Item	<a href="https://hdl.handle.net/20.500.14394/36749">https://hdl.handle.net/20.500.14394/36749</a>

# Default Feature Prespecification: The Two [i]'s of Kashaya

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There are two basic ways in which a morpheme can be phonologically exceptional:

- (1) a. By failing to undergo an expected rule.
- b. By triggering an unexpected rule.

The complementary cases, i.e. undergoing an unexpected rule or failing to trigger an expected rule, are the result of opposite assumptions regarding what is 'expected', and need not constitute distinct formal possibilities.<sup>1</sup>

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I would like to thank the following people for their comments on the written and spoken versions of this paper: Sharon Inkelas, Junko Itô, John McCarthy, Brian McHugh, Rolf Noyer, Jaye Padgett, and Donca Steriade. The data in this paper are from Oswalt 1961 and Buckley 1994; see those references for more detailed discussion of the processes presented here.

<sup>1</sup> An example of a case where a small set of forms undergo an 'unexpected' (because marked) process is the voicing of a final fricative in the conversion of a noun to a verb in English: *a hou[s]e, to hou[z]e* (cf. the different approach in Chomsky and Halle 1968 and Zonneveld 1978). This could conceivably be assimilated to the case in (1a) by assuming that the rule is actually expected in all cases, and words such as *a mou[s]e, to mou[s]e* (in my pronunciation) are exceptions marked phonologically by prespecification of [-voice]. Given that *hou[z]e* (rather than *mou[s]e*) is the less common pattern, however, I suspect that the best solution for such cases lies in an arbitrary exception feature (as in (2a)); see also §5.

Further, in a derivational approach there are two basic ways in which to encode the exceptionality of a morpheme:

- (2) a. A lexical exceptionality feature which says “I trigger rule 26” or “I don’t undergo rule 17”.
- b. A phonological feature which triggers or blocks the relevant rule.

The rule diacritic of (2a) is arbitrary, unconstrained, and makes no predictions about the behavior of the morpheme beyond that rule. Mohanan 1991 claims that (2b) is no better:

- (3) “...the use of underspecification to stipulate the distinction between alternating and nonalternating forms has no special advantage over the stipulation of lexical exceptionality.” (p. 323)

This is clearly false insofar as the use of a substantive element of the theory (i.e. a feature) makes further predictions about the behavior of the prespecified segment. Based on data from the Pomoan language Kashaya of northern California (Oswalt 1961, Buckley 1994), I argue that prespecifying the [i] in a small set of suffixes as [+high] — in contrast with other tokens of [i] which are fully unspecified — provides a single, principled explanation for the suffixes’ exceptionality in three independent rules. The analysis supports similar arguments by Kiparsky 1982, 1993, Poser 1984, Pulleyblank 1986, Hualde 1991, Inkelas and Cho 1993, Archangeli and Pulleyblank 1992, and others. While not all types of exceptionality can be treated in these terms, a large set of cases can be, with a consequent simplification of the individual language’s grammar, as well as an increase in the predictive power of the analysis.

### 1. Regular alternations

On the surface, Kashaya has the five vowels [i, e, a, o, u]. Barring the intervention of rules, the epenthetic vowel is [i].

(4)	mo-ht-mul-?	→	móht̥imul’	‘run around (pl)’
	mu-bo·hk̥-w	→	mobohk̥íw	‘swell up (pl)’
	di-hyut-c-w	→	dihyút̥c̥jw	‘crumble by dropping’
	t-ht-m-?	→	t̥iht̥im	‘put feet above ground (pl)’

Following work in prosodic syllabification (such as Itô 1986, 1989), I assume that epenthesis inserts an unspecified mora and the features for /i/ are provided by rule. This permits non-epenthetic tokens of /i/ to be underspecified as well: the parallel treatment is motivated not only by considerations of simplicity in underlying repre-

sentations, but also by the fact that both suffixal and epenthetic /i/ undergo the same set of ‘mutations’ when following particular consonants.<sup>2</sup>

By an unusual rule, the vowel /i/ becomes [a] after /m/; and by a more unusual but nonetheless productive process it becomes [u] after /d/. These can be treated as insertion of the features [+low] and [+back], respectively.<sup>3</sup>

- (5) /mi/ → [ma]
- |                        |   |                      |                         |
|------------------------|---|----------------------|-------------------------|
| p <sup>h</sup> a-nem-i | → | p <sup>h</sup> anemá | ‘punch him!’            |
| mo-m-in                | → | momán                | ‘while running across’  |
| mo-m-inś               | → | mománś               | ‘I guess he ran across’ |
| kel-m-w                | → | kélmaw               | ‘peer directly down at’ |
- 
- (6) /di/ → [du]
- |                 |   |             |                         |
|-----------------|---|-------------|-------------------------|
| wa-ad-i         | → | wa·du       | ‘come here!’            |
| mo-m-ad-i       | → | momá·du     | ‘keep running across’   |
| mahsad-in       | → | mahsadún    | ‘while taking away’     |
| cad-inś         | → | cadúnś      | ‘I wonder if he saw it’ |
| cahno-ad-iyiç-? | → | cahnodu·yí? | ‘talk to oneself’       |

The word *kélmaw* in (5) is derived from intermediate *kelmiw* with epenthetic [i]; this illustrates that both underlying and inserted [i] undergo the [ma] mutation. The morphology of the language provides no way of testing whether the epenthetic vowel would undergo the [du] mutation; I predict that it would.

No underlying round vowels occur suffix-initially; but the special status of /i/ is shown by the fact that of the other vowels which are found here (/e, a/), neither undergoes these mutations.

- (7) /me/ → [me]
- |                          |   |                        |                          |
|--------------------------|---|------------------------|--------------------------|
| p <sup>h</sup> a-nem-eti | → | p <sup>h</sup> aneméti | ‘even though he was hit’ |
| caq <sup>h</sup> am-ela  | → | caq <sup>h</sup> améla | ‘I’m cutting it’         |
- 
- /ma/ → [ma]
- |                           |   |                          |                       |
|---------------------------|---|--------------------------|-----------------------|
| mo-m-ad-i                 | → | momá·du                  | ‘keep running across’ |
| caq <sup>h</sup> am-ala-w | → | caq <sup>h</sup> amá·law | ‘cut downward’        |

<sup>2</sup> I use the term ‘mutation’ here to distinguish these changes from truly assimilatory processes which can be expressed as spreading rules.

<sup>3</sup> Only three features are necessary to distinguish the five vowels /i, e, a, o, u/. Buckley 1994 uses [–high], [+back], and [+round]. Since these features require a more complex treatment of the vowel /a/, in this paper I use [+low] rather than [+round] as the third feature. The basic point of the paper, i.e. that [+high] must also be used, is the same under either analysis. Note also that the surface segment [d] is actually derived from underlying /n/ (see Buckley 1994); I have omitted this step from the derivations in this paper, and use /d/.

- (8) /de/ → [de]  
 miṭi-c-id-em → miṭiṭi·c·dem 'while he is lying down'  
 mo-ad-e → mo·dē 'ran along (NONFINAL)'
- /da/ → [da]  
 du-hlud-ad-i → duhludá·du 'keep picking'  
 ma·d-al → ma·dal 'her'

The generalization to be garnered from these data is that only fully unspecified vowels — i.e. tokens of the vowel /i/ — undergo the [ma] and [du] mutations, which must therefore be structure-building only. This formulation is superior to specifying in each rule that the [ma] and [du] mutations apply specifically to /i/, since the similarity becomes a pure coincidence; the alternative also fails to relate the mutations to the special status of /i/ as the epenthetic vowel.

## 2. Anomalous /i/

In addition to /e, a/, which never mutate after /m, d/, there are instances of surface [i] in particular morphemes (notated /i/ here) which also resist these mutations. This vowel is found in 3 of the 21 [i]-initial suffixes in the language.<sup>4</sup>

- (9) -ībic Inchoative; 'up, away'  
 -īyic Reflexive  
 -īc Reflexive

Although each suffix ends in a palatal affricate, their special behavior cannot be reduced to this fact: the Reflexive also has the nearly identical (and idiosyncratically selected) allomorphs -iyic and -ic which contain plain /i/ (see (6) for an example).

- (10) /mī/ → [mi]  
 caq<sup>h</sup>am-ībic-? → caq<sup>h</sup>amī·bi? 'start to cut with a knife'  
 q<sup>h</sup>osam-ībic-? → q<sup>h</sup>osamī·bi? 'winter to begin'

<sup>4</sup> Junko Itô makes the interesting observation that one might try to relate the presence of /i/ in suffix-initial position to the lack of distinctive rounding in the same position. I have, however, been unable to come up with a satisfactory account of this correlation, and am not convinced that it is significant. A complication also arises in accounting for the morpheme-internal sequences [mi] and [di]. In an approach such as Kiparsky 1993, where rule blocking in nonderived environments is the result of prespecification, one would have to block the [ma] and [du] mutations by giving the sequences /mī/ and /dī/ underlyingly. This would mean that /i/ can occur in the same environment as round vowels, since, for example, /mu/ and /do/ are also well attested in Kashaya. It is interesting to note that, consistent with the clear prediction of Kiparsky's theory, the structure-changing rule of Uvular Assimilation which makes any vowel [a] after /q/ is not subject to a similar blocking in non-derived environments: all /q/'s are followed by /a/ even within a morpheme (Buckley 1994). No prespecified feature could possibly prevent Uvular Assimilation, since the rule replaces whatever features may be there.

- (11) /d̥i/ → [di]  
 cahno-ad-íç-? → cahno·d̥í? 'talk to oneself'  
 cahno-ad-iyíç-? → cahnod̥j̥yí? 'talk to oneself'

If no mutation or other rule applies, /i/ and /i/ are pronounced identically on the surface, as [i]; but the failure to mutate, illustrated in (10) and (11), in itself suggests that there is something special in the phonological representation of /i/. Further evidence comes from its interaction with uvulars.

The segments /q, q<sup>w</sup>/ trigger assimilation of any following vowel to [a, o] respectively, whether that vowel is specified or featureless.<sup>5</sup> This can be accounted for by a structure-changing rule which spreads the place features rightward.

- (12) /qi/ → [qa]  
 sima·q-i → sima·qá 'sleep!'  
 ?usaq-in → ?usá·qan 'while washing the face'  
 ?usaq-iyíç-i → ?usá·qayí·çí 'wash yourself!'
- /qe/ → [qa]  
 sima·q-eti → sima·qatí 'although he's asleep'  
 p<sup>h</sup>i-?ya·q-ela → p<sup>h</sup>i·?ya·qalá 'I recognize it'
- /qa/ → [qa]  
 mo-aq-ad-i → moqá·dú 'keep running out from here'  
 sima·q-añ-i → simaqa·du 'keep sleeping'
- (13) /q<sup>w</sup>i/ → [qo]  
 coq<sup>w</sup>-i → coqó 'shoot!'  
 p<sup>h</sup>a-?soq<sup>w</sup>-in → p<sup>h</sup>a·?soqón 'while mashing'  
 ce-aq<sup>w</sup>-in → ce·qón 'while opening out toward here'
- /q<sup>w</sup>e/ → [qo]  
 woq<sup>w</sup>-em → woqóm 'while flowing'  
 mo-maq<sup>w</sup>-ela → momá·qola 'I am running in'
- /q<sup>w</sup>a/ → [qo]  
 mo-aloq<sup>w</sup>-ad-i → molo·qodú 'keep running up'  
 p<sup>h</sup>a-?soq<sup>w</sup>-ala-w → p<sup>h</sup>a·?soqó·law 'mash downward'

<sup>5</sup> The rounded uvular /q<sup>w</sup>/ never appears on the surface with a degree of rounding greater than that of an adjacent [o]; consequently the sequence is transcribed here simply as [qo] or [oq].

When /q/ precedes /i/ the vowel is unchanged. Instead the /q/ becomes [k] by a rule of Uvular Raising; that is, not only does /i/ fail to change, but it causes the preceding consonant to change instead.

- (14) /q<sup>i</sup>/ → [ki]
- |                             |   |                          |                          |
|-----------------------------|---|--------------------------|--------------------------|
| ʔusaq-îbic-ʔ                | → | ʔusá·kibiʔ               | ‘start to wash the face’ |
| mic <sup>h</sup> aq-îbic-ʔ  | → | mic <sup>h</sup> akí·biʔ | ‘start to sweat’         |
| šiniyaq-îbic-ʔ              | → | šiniyá·kibiʔ             | ‘start to shrink’        |
| p <sup>h</sup> i-ʔya·q-îc-ʔ | → | p <sup>h</sup> iʔya·kíʔ  | ‘notice (about) oneself’ |

With /q<sup>w</sup>/, however, no Raising occurs; instead we find Assimilation.

- (15) /q<sup>w</sup>i/ → [qo]
- |  |   |                           |                     |
|--|---|---------------------------|---------------------|
| woq <sup>w</sup> -îbic-ʔ                   | → | woqó·biʔ                  | ‘start to flow’     |
| qašo·q <sup>w</sup> -îbic-ʔ                | → | qašoqó·bíʔ                | ‘be getting better’ |
| p <sup>h</sup> a-ʔsoq <sup>w</sup> -îbic-ʔ | → | p <sup>h</sup> aʔsoqó·biʔ | ‘start mashing’     |

I assume that Uvular Raising fails with /q<sup>w</sup>/ in (15) due to Structure Preservation: application of the rule would create the ill-formed segment /k<sup>w</sup>/, and so is blocked. The examples in (15) show that Uvular Assimilation can in fact apply to /i/, as it applies to any other vowel with features, but in (14) is simply bled by Raising.<sup>6</sup>

### 3. General analysis

The facts discussed so far are summarized in the following table.

(16)

	/i/	/e/	/a/	/î/
<i>undergoes [ma] mutation?</i>	yes	no	no	no
<i>undergoes [du] mutation?</i>	yes	no	no	no
<i>undergoes Uvular Assimilation?</i>	yes	yes	yes	(yes)
<i>triggers Uvular Raising?</i>	no	no	no	yes

The special behavior of /î/ can be divided into two types. As a **non-undergoer**, /î/ resists the [ma] and [du] mutations; in this respect it is identical to /e/ and /a/. As a **trigger**, /î/ causes Uvular Raising; in this respect it is unique. I argue for the following general treatment of the special behavior. The vowel /î/ is a non-undergoer of mutation because it bears at least one underlying feature (as do /e, a/), and the mutations apply only to a featureless vowel, namely /i/. It is a trigger of Uvular Raising because it bears some feature which /e/ and /a/ do not. Raising must precede Uvular Assimilation so that it will bleed it in the case of /q<sup>i</sup>/.

<sup>6</sup> The forms in (15) are one possible realization of /q<sup>w</sup>i/; depending on factors which are not entirely clear, but partly relate to dialect, it is also possible to find the failure of either Assimilation or Raising, e.g. *woqí·biʔ*. This alternate is **never** possible with plain /i/ after a uvular, where assimilation to a back nonhigh vowel always occurs.



#### 4. Possible approaches

If we take seriously the claim of contrastive specification (e.g. Steriade 1987, Clements 1988, Mester and Itô 1989) that segments must be specified for all and only the features by which they contrast with another segment, it is not clear how we can treat /i/ and /î/ differently, since their full specifications are identical. Note that /i/ contrasts with /e/ and must be marked [+high], so this feature cannot then be used to mark the exceptionality of /î/.

(20)		<u>i</u>	<u>î</u>	<u>e</u>	<u>a</u>	<u>o</u>	<u>u</u>
	[high]	+	?	-		-	+
	[back]	-	-	-		+	+
	[low]	-	-	-	+	-	-

If we relax the requirements of contrastive specification, such that segments with features must be specified according to their contrastiveness, but one featureless segment is also permitted, we arrive at a workable representation.

(21)		<u>i</u>	<u>î</u>	<u>e</u>	<u>a</u>	<u>o</u>	<u>u</u>
	[high]		+	-		-	+
	[back]		-	-		+	+
	[low]		-	-	+	-	-

Here it is, in essence, /i/ which is treated as special. This could be thought to result from its identity with the epenthetic vowel, since both of them receive their features by default.<sup>8</sup> The essential elements of the proposed analysis are satisfied: /i/ has no features, /e/ and /a/ bear at least one feature, and /î/ is [+high]. No problem is posed by the presence of additional features on /î/ and the other vowels. Because of this, we could go so far as to abandon **all** underspecification on the vowels except for /i/; this differs minimally from the representation in (21).

(22)		<u>i</u>	<u>î</u>	<u>e</u>	<u>a</u>	<u>o</u>	<u>u</u>
	[high]		+	-	-	-	+
	[back]		-	-	+	+	+
	[low]		-	-	+	-	-

My point is that we must have the possibility of a featureless vowel which is, on the surface, identical to a vowel with underlying features.

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Buckley 1994 for the tentative use of prespecified [-round] to mark an exceptional variety of /a/ in Kashaya.

<sup>8</sup> The default features need not be supplied by a set of rules, each of which inserts a single feature, e.g.  $\emptyset \rightarrow$  [+high],  $\emptyset \rightarrow$  [-back], [+high]  $\rightarrow$  [-low]. Rather, the analysis is entirely compatible with a rule which supplies all features on a placeless vowel in one fell swoop, e.g.  $\emptyset \rightarrow$  [+high, -back, -low].

The approaches in (21) and (22) are not the only possible ones. First, note that like contrastive specification, radical underspecification (Kiparsky 1982, Archangeli 1984, Pulleyblank 1986), strictly interpreted, is also incompatible with the analysis. In this case it is because only one value of a given feature is permitted underlyingly, and we cannot give [-high] for /e/ at the same time as [+high] for /i/.

(23)

	i	î	e	a	o	u
[high]		?	-		-	
[back]					+	+
[low]				+		

Combinatorial specification (Archangeli and Pulleyblank 1992) offers a slightly but crucially different possibility.

(24) “The central difference between the Radical and Combinatorial models is that radical underspecification *requires* the elimination of phonological redundancy; Combinatorial Specification *prefers* such elimination (Representational Simplicity) but counteracts the tendency towards such elimination by the principle of Recoverability.” (pp. 89-90)

This approach, then, provides an explicit and integrated account for exceptionality as prespecification. For us, this means that both values of [high] are permitted, but it is not necessary for every token of [i] to be given the same underlying features: only the [i] which exhibits special behavior has underlying [+high].

(25)

	i	î	e	a	o	u
[high]		+	-		-	
[back]					+	+
[low]				+		

In (25), both [-high] and [+high] are active features of the language, as are [+back] and [+low]. Given these four active features, there are 16 logical combinations. Eliminating those which are substantively incoherent — four which combine [+high] and [-high], two more which combine [+high] and [+low] — we end up with 10 combinations:

(26) (û) î (â) (â) o e (â) a u i

+HI	+HI	-HI	-HI	-HI	-HI	+LO	+LO		
+BK		+LO	+LO	+BK	+BK	+BK	+BK		

Simplicity demands that no feature be included in an underlying representation unless overridden by Recoverability, i.e. the need to make minimal distinctions among segments and morphemes. We do not find /û/ because it never occurs morpheme-

initially and the learner has no reason to posit it.<sup>9</sup> Similarly, there is no reason to posit more than one /a/; Simplicity demands the least specified one, which has just [+low].

Archangeli and Pulleyblank 1992 present analyses of other languages which show interesting similarities to Kashaya. For example, Barrow Inupiaq also has two versions of [i] (cf. Bourgeois 1988). As with the Kashaya vowels, we find both types of exceptionality: triggering an unexpected rule, and failure to undergo an expected rule. The surface inventory of Inupiaq is [i, a, u].

- |      |                   |             |   |
|------|-------------------|-------------|---|
| (27) | /i <sub>1</sub> / | [-back]     | triggers Coronal Palatalization<br>does not undergo Dorsal and Labial Assimilation  |
|      | /i <sub>2</sub> / | featureless | undergoes Dorsal and Labial Assimilation<br>does not trigger Coronal Palatalization |

Dorsal (28) and Labial Assimilation (29) affect only /i<sub>2</sub>/, but not any vowels with features, namely /a, u, i<sub>1</sub>/.

- |      |    |                       |   |                  |              |
|------|----|-----------------------|---|------------------|--------------|
| (28) | a. | nigi <sub>1</sub> -q  | → | niggiq           | 'eat-NOM'    |
|      | b. | qupi <sub>2</sub> -q  | → | quppaq (*quppiq) | 'cleave-NOM' |
| (29) | a. | ammi <sub>1</sub> -m  | → | ammim            | 'skin-REL'   |
|      | b. | kamji <sub>2</sub> -m | → | kamjum (*kamjim) | 'boot-REL'   |

Conversely, Coronal Palatalization is triggered only by /i<sub>1</sub>/.

- |      |    |                        |   |                                     |                          |
|------|----|------------------------|---|-------------------------------------|--------------------------|
| (30) | a. | nigi <sub>1</sub> -lla | → | nigi $\underline{\underline{ll}}$ a | 'be able to eat'         |
|      | b. | tiŋi <sub>2</sub> -lla | → | tiŋilla (*tiŋilla)                  | 'be able to take flight' |

The special behavior of /i<sub>1</sub>/ in these three rules is accounted for uniformly by the presence of [-back]. This is parallel to the prespecification of [+high] that we have seen for Kashaya /i/.

Another useful comparison is Kalenjin (cf. Antell et al. 1973, Halle and Vergnaud 1981). This language has bidirectional [+ATR] harmony (31a) which is idiosyncratically blocked by three morphemes: *ma-*, *ka-*, *-kε* (31b). Archangeli and Pulleyblank argue that the blocking vowels are specified as [-ATR]. (The underdot in [a] indicates [+ATR].)

<sup>9</sup> The theory predicts the possibility of a suffix-initial [u] which triggers Uvular Raising just as /i/ does. I consider this to be a reasonable prediction, one which simply cannot be tested in the available data since no rounded vowel occurs as the initial element of a suffix.

- (31) a. *no blocking*  
 kI-A-ke:r-In → kiąe:rin ‘I saw you (sg)’
- b. *blocking*  
 kA-ma-A-ke:r-Ak → kamaąke:rąk ‘I didn’t see you (pl)’

This case illustrates the need for both values of the same feature, and creates a ternary distinction:

- (32) [+ATR] triggers harmony e.g. ke:r  
 [-ATR] blocks harmony e.g. ma-  
 [OATR] undergoes harmony, otherwise surfaces as [-ATR] e.g. A-

As Archangeli and Pulleyblank note, “...ternary power with a binary feature is indeed available, although such power is not commonly utilized [due to] the tendency to maximize combinatorial possibilities of F-elements” (p. 90). The Kalenjin case is parallel to the need in Kashaya for [-high] in /e/, [+high] in /i/, and [Ohigh] in /i/. It is of course possible to avoid this situation by positing **complementary privative features**, e.g. [ATR] and [RTR] for [ $\pm$ ATR] in Kalenjin, and [high] and [mid] for [ $\pm$ high] in Kashaya (cf. Steriade 1993). The need remains, however, for an underlying ternary contrast which is binary on the surface, even if treated as e.g. [high] ~ [mid] ~  $\emptyset$ . That is, [high] must still contrast with  $\emptyset$ , and we must permit (non-trivial) underspecification of a feature which is eventually filled in.

## 5. Conclusion

Kashaya combines the ternarity of Kalenjin with the double exceptionality (as trigger and non-undergoer) of Barrow Inupiaq. The analysis presented here requires underspecification of a type explicitly accommodated under combinatorial specification, but not under strict definitions of radical or contrastive (under)specification.<sup>10</sup> A modified view of contrastive specification can also handle the data, but with uncertain implications for the basic assumptions of that approach.

<sup>10</sup> In the nonderivational approach of Optimality Theory (Prince and Smolensky 1993), one could potentially assume that /i/ and /i/ are both fully specified in UR. The special behavior of the three exceptional suffixes could then be accounted for by treating them as inducing a reranking of phonological constraints, for example such that [+high] will ‘spread’ and give the effect of Uvular Raising only for those suffixes. This differs from the present analysis primarily in that the exceptionality becomes a property of the morpheme rather than the segment. While this difference could in theory make distinct empirical predictions, there is no way of testing it in Kashaya. It resembles the present approach, however, in that it manipulates a substantive phonological element of the theory, namely constraint ranking, and therefore makes potential predictions about the further behavior of the morpheme (unlike an arbitrary diacritic). In particular, reranking a feature licensing constraint relative to a faithfulness constraint is *mutatis mutandis* rather like prespecification in

How general can this type of solution be? Mohanan (1991, 323) writes that the use of prespecification to mark exceptionality “cannot be extended to alternations which clearly involve structure changing operations, such as the absence of trisyllabic shortening in exceptions like *obesity* in English.” But even if some cases of exceptionality refuse to submit to a phonological treatment by prespecification, that does not invalidate the use of this more restrictive approach in those cases that permit it. A useful analogy is the treatment of allomorphy. Some allomorphs, while phonologically conditioned, must simply be listed, since there is no plausible way to derive one from the other. For example, the Warlpiri ergative suffix is *-ngku* after the minimal stem of two syllables, and *-rlu* after longer stems (Dixon 1980, Carstairs 1988); given in particular that the **segmental** alternation in the suffix is determined by a **prosodic** property of the stem, these forms must be listed. This does not, however, invalidate treating the English plural suffix alternates (*-s/-z/-əz*) as derived from a single form, e.g. */z/*. Expressing the English allomorphy by means of rules of epenthesis and voicing assimilation serves as a formalization of the explanation for why, for example, it is precisely after voiceless nonsibilant obstruents that we find *-s*. This fact is not arbitrary, and should not be treated as such. In Warlpiri, on the other hand, the correlation between *-ngku* and disyllabic stems is arbitrary, and is properly (indeed, necessarily) treated as such.<sup>11</sup> Similarly, even if *obesity* is an arbitrary exception to trisyllabic shortening, the relationship between the exceptionality of Kashaya */i/* with regard to Uvular Raising and the two mutations is surely not arbitrary. The analysis presented here provides a principled formal account which explains why these three instances of exceptionality should coincide in a single segment, and why that segment should be one which in the default situation surfaces as [+high].

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a derivational framework. One must also distinguish coherent sub-phonologies (as in Japanese) from morphemes which exhibit a single special characteristic (as in the [+high] of Kashaya */i/*). I do not pursue the optimality analysis here because it entails, in essence, a separate subgrammar for these suffixes; and at present the larger implications of permitting the reordering of constraints on a morpheme-specific basis are quite unclear.

<sup>11</sup> Although the allomorph *-ngku* [ŋku] is heavier than *-rlu* [lu], it seems unlikely that this is an adequate synchronic explanation for their distribution; the disyllabic stem is already a proper prosodic word, and Warlpiri stress is quantity insensitive (Nash 1986, Poser 1989; but cf. also the perspective of Kager 1992). At any rate there is no strictly phonological rule which will change *-rlu* to *-ngku* or vice versa, which is the essential difference from the English plural case.

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